

## ***Acropora rongelapensis* sp. nov., a new species of *Acropora* from the Marshall Islands (Scleractinia: Astrocoeniina: Acroporidae)**

ZOE T. RICHARDS & CARDEN C. WALLACE

Museum of Tropical Queensland, 78-102 Flinders Street, Townsville Queensland 4810, Australia  
zoer@mtq.qld.gov.au

### **ABSTRACT**

A new coral species, *Acropora rongelapensis*, from the northern central Pacific Ocean is described. On present records, this species appears to be endemic to the Republic of the Marshall Islands. Distinguishing features of the species include sub-flattened branches with widely separated radial corallites born laterally. Diagnostic characters of the new species place it within the *Acropora loripes* group.

**Key words:** Cnidaria, Anthozoa, Scleractinia, *Astrocoeniina*, *Acroporidae*, Marshall Islands, Central Pacific

### **INTRODUCTION**

The genus *Acropora* (Oken, 1815) was revised worldwide by Wallace (1999) and a neotype for the type species *Acropora muricata* was created. Veron (2003) added 16 new species and Veron (2000) reinstated several species out of synonymy. The species herein described was collected from a deep lagoonal habitat at Rongelap Atoll, one of the most northerly atolls on the Ralik archipelago island chain in the Marshall Islands. In the main treatise on Marshall Island corals (Wells, 1954), 10 species of *Acropora* are recorded from trawl grabs at Rongelap Atoll. None of the available species names covered in the above treatments appears to cover the present material, which is herein recognized as a new species. In a recent survey, 87 sites were surveyed across four of thirty atolls in the Marshall Islands (Rongelap, Bikini, Ailinginae, Mili), however this species was only located at one survey site.

## METHODS

One holotype and two paratypes were collected from the type locality. Skeletal specimens are deposited at the Queensland Museum, Museum of Tropical Queensland campus and registered on a specimen database. Samples for molecular analysis are stored in 100% ethanol at the Museum of Tropical Queensland awaiting further investigation. Specimens were examined by light and electron microscopy. Types of *A. rongelapensis* were examined using a Wild Leitz microscope with eyepiece graticule and photographed using a Nikon N-90 with a 105 mm macro lens. Scanning Electron Micrographs were taken at the Advanced Analytical Centre at James Cook University. Field images were taken by Silvia Pinca. Terminology and measurements used are as described in Wallace (1978), Veron and Wallace (1984), and Wallace (1999).

## RESULTS

### Family *Acroporidae* Verrill, 1901

### Genus *Acropora* Oken, 1815

### Subgenus *Acropora* Oken, 1815

Single axial corallite forms axis of branch, opening at tip. Radial corallites and coenosteum various (Wallace, 1999).

### **The *Acropora loripes* group (Wallace, 1999)**

Radial corallites rounded appressed tubular; with a tendency towards the absence of radial corallites on distal parts of the colony. Coenosteum based on elaborated spinules, densely arranged throughout. Colony shape various based on development of secondary branchlets, either hispidose or corymbose form.

### ***Acropora (Acropora) rongelapensis* sp. nov.**

#### *Material examined*

*Holotype.* G 57574 Marshall Islands, Rongelap Atoll lagoon, 11°46.1'N 166°67.0'E depth 30m, coll. Z. Richards, date 26.VII.2003.

*Paratypes.* G 57575 Marshall Islands, Rongelap Atoll lagoon, 11°46.1'N 166°67.0'E, depth 32m, coll. Z. Richards, date 26.VII.2003.

G 57576 Marshall Islands, Rongelap Atoll lagoon, 11°46.1'N 166°67.0'E, depth 28m, coll. S. Pinca, date 08.IX.03

*Skeletal characteristics (based on holotype)*

*Corallum.* Side attached open branching plate 20 cm max. diameter, with horizontally flattened branches; main branches 4–12 mm wide and up to 100 mm long. Secondary branches up to 45 mm long. Branches round with a flattened base in cross-section, strongly tapered and distal branchlets upcurving.

*Corallites.* Axial corallites exsert up to 10 mm. Axial corallites outer diameter 1.2–1.9 mm, inner diameter 0.5–0.8 mm. Calices round, primary septa present up to  $\frac{2}{3}$  R, a few to all secondary septa present up to  $\frac{1}{2}$  R. Radial corallites mixed sizes, not touching, appressed tubular or tubular exsert tending towards immersed or sub-immersed on main branch. Incipient axial corallites difficult to distinguish from tubular radial corallites. Incipient axial corallites and radial corallites occurring laterally along flattened branch tips are tubular. A few exsert tubular corallites are borne along the centre of branches.

*Coenosteum*

Densely arranged elaborated spinules throughout. Some degree of infilling evident as coenosteum has anamostosed towards branch bases.

*Variation Based on Paratypes*

Paratype G57576 resembles holotype in all characters except axial corallite diameters are slightly larger (outer diameter 1.9–2.7 mm, inner diameter 0.7–1.0 mm).

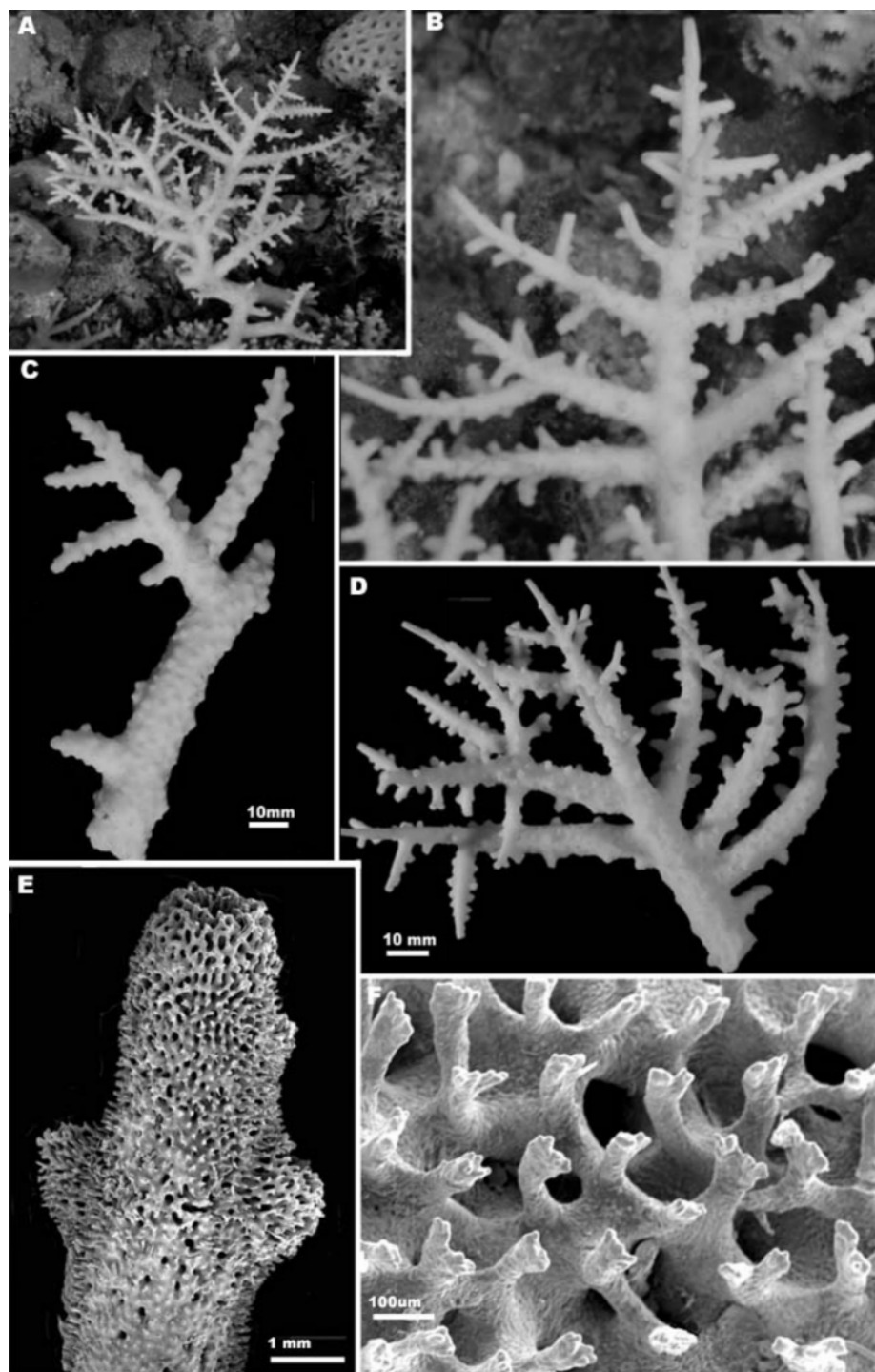
Paratype G57575 tends towards an open branching growth form and is apparently from a larger colony than the holotype. Branches are thicker than in the holotype, up to 18 mm diameter, but of similar length. Branches are round or round with a flat base in cross-section. Axial corallites are round and less extended, outer diameter larger than in holotype (1.8–2.9 mm), inner diameter same as in holotype.

*Field Characteristics*

Small colonies up to 20 cm in diameter, uniform light brown with a whitish glow due to the dense skeleton. Long, bare axial corallites are very prominent. Laterally flattened branches distinguish this species. Occurs subtidally in lagoonal locations. Found at 28–32 m depth.

*Remarks*

Types of *A. rongelapensis* show potential for variation in growth ranging from open branching, side-attached plates to open branching arborescent. Variation also exists in axial corallite size, with outer axial corallite diameter ranging from 1.2–2.9 mm and inner diameters range from 0.5–1.0 mm. It is considered that the samples collected thus far are not adequate to represent the full extent of skeletal variation as well as maximum colony size.



**FIGURE 1.** *Acropora rongelapensis* (A) Paratype G57576 *in situ* at Rongelap Atoll lagoon, Marshall Islands; (B) close-up of A; (C) portion paratype G57575 (D-F) holotype specimen G57574 (E) electron micrograph of holotype showing axial and radial corallites (F) electron micrograph of holotype showing coenosteum between radial corallites.

### Comparisons

We have placed this species in the *Acropora loripes* group because it is most similar to *A. simplex* (Wallace and Wolstenholme, 1998). However, because of the reduced number of radial corallites and the particularly flattened branches, there is also some similarity to the *A. elegans* group, and further specimens may indicate a stronger affinity to that group. The molecular material may resolve this issue in the future.

### ACKNOWLEDGEMENTS

The authors thank all members of the Natural Resource Assessment Survey Team of the Marshall Islands, especially co-leaders Silvia Pinca and Maria Beger for their determination, immaculate planning and fundraising, special thanks to Silvia for collecting additional specimens from Rongelap Atoll. We also thank financial donor agencies: National Fisheries and Wildlife Foundation; the US Dept of Interior – Office of Insular Affairs; the Marshall Islands Marine Resource Authority; the College of the Marshall Islands; and the Rongelap Atoll Local Government, particularly Mayor James Matayoshi and RALGov Senator Hon. Abacca Maddison. We would also like to thank staff and crew of Bravo and Oleanda, and Paul Muir for Electron Microscopy.

### REFERENCES

- Linnaeus, C. (1758) *Systema naturae* (ed. 10), 1, 1–824. Laurentii Salvii, Holmiae.
- Oken, L. (1815) Steinkorallen. *Lehrbuch Naturgesch*, 3, 59–74.
- Veron, J.E.N. (2000) *Corals of the World – Volume 1*. Australian Institute of Marine Science. Townsville, Australia, 176–433 pp.
- Veron, J.E.N. (2003) *New species described in Corals of the World*. Australian Institute of Marine Science, 2002. Townsville, Australia, 206 pp. Printed April, 2003.
- Veron, J.E.N & Wallace, C.C. (1984) Scleractinia of Eastern Australia. Part V. Family Acroporidae. *Australian Institute of Marine Science Monograph Series*, 6, 1–485.
- Verrill, A.E. (1901) Variations and nomenclature of Bermudian, West Indian and Brazilian reef corals, with notes on various Indo-Pacific corals. *Transactions of the Connecticut Academy of Arts and Sciences*, 11, 207–266.
- Wallace, C.C. (1978). The coral genus *Acropora* (Scleractinia: Astrocoeniina: Acroporidae) in the central and southern Great Barrier Reef Province. *Memoirs of the Queensland Museum*, 18, 273–319, pls 43–103.
- Wallace, C.C. (1999) *Staghorn Corals of the World. A revision of the coral genus Acropora (Scleractinia; Astrocoeniina; Acroporidae) worldwide, with emphasis on morphology, phylogeny and biogeography*. CSIRO Publishing, Victoria, Australia, pp. 303–342.
- Wallace, C.C. & Wolstenholme, J. (1998) Revision of the coral genus *Acropora* (Scleractinia: Astrocoeniina: Acroporidae) in Indonesia. *Zoological Journal of the Linnean Society*, 123, 199–384.
- Wells, J. (1954) Recent corals of the Marshall Islands. U.S. Geological Survey Professional Paper 260-I: United States Printing Office, Washington. I–IV, 385–486, plates 94–185 + map and supplementary papers.